4162

Diag. Cht. No. 5102-2

Form 504

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

State: California

11—5613

DESCRIPTIVE REPORT.

Hydrographic *Sheet No.* 4162 ~~(A)~~ (B)

LOCALITY:

~~Los Angeles Harbor~~

San Pedro Bay

Huntington Beach to

Pt. Fermin.

1920

CHIEF OF PARTY:

F. G. ENGLE

4162

DESCRIPTIVE REPORT

To accompany Hydrographic Sheets

(A) scale 1:10,000 Los Angeles Harbor

and

(B) scale 1:20,000 San Pedro Bay.

(1) The work on these sheets was done in accordance with Instructions dated May 12, 1920, the sheets being outlined therein, and the spacing and position of the lines indicated on bromide copy of Hydrographic Sheet #1418 accompanying the instructions, as a minimum development. In the inner harbor or channel the instructions called for only sufficient work to verify the Army and Harbor Engineers' maps.

(2) The control consisted of prominent artificial objects and five new marked triangulation stations on which hydrographic signals were built, established between Long Beach and Huntington Beach, cut in from the recovered stations, Breakwater L. H., Solitary, Clarence Hotel Cupola, Los Cerritos, Deadmans Isl., Pt. Fermin L. H., and Pt. Fermin. The principal stacks, tanks, and prominent objects in the vicinity of San Pedro and Long Beach were cut in by theodolite. For the close inshore development some objects located by planetable were also used.

(3) That part of the outer harbor lying within the breakwater and westward of a line northerly from the breakwater together with the work in the inner harbor and the close inshore development of the coast extending to Long Beach was done with 24' motor sailing launch in charge of Mr. R. P. Eyman, H. & G. Engineer. The remainder of the work was done by the Natoma in charge of F. G. Engle, Chief of Party, using hand lead on all work on the 1:10,000 sheet and on that part of the 1:20,000 sheet eastward of the breakwater L. H. within 12 fathoms. Between 12 and 20 fathoms a trolley sounding apparatus was used and in the development of the submarine valley at the S.E. corner of the sheet, a hand leadline and a hand sounding machine were used, stopping to sound. On portions of the hand lead and trolley work, leadlines of hemp with wire cores were used and appeared to give more accurate soundings than the plain braided cotton lines used on the remainder of the work, due to the smaller stretch in the line when taking the the weight of lead on reaching bottom.

(4) Sounding lines eastward of the breakwater in general were run so as to split the spaces between the old sounding lines on sheet #1418, and crossing lines were also run, to test the accuracy of the work. Other lines were run over spots where discrepancies existed in the old work. A development was also made of the 10 fathom spot 135° from the breakwater light. Rocky and gravel bottom with least depth of 11 fathoms was encountered on the shoal spot and was the only rock or gravel bottom found in the area surveyed with the exception of one sounding in the

submarine valley. A few rocky bottom soundings were obtained off the Long Beach Harbor jetties but appeared to be rock accidentally dropped from barges in course of constructing the jetties.

(5) In accordance with instructions only sufficient lines were run in the inner harbor, channels, basins, and slips to verify city and Army Engineer maps. A blue print was obtained from the Harbor Engineer's Office showing results of their surveys. This is the latest information they have published and is identical with the print forwarded with the instructions, sub plan (2). The Army Engineers have published no map showing soundings in the harbor and in fact, have not made any regular survey outside of soundings from the dredges. Mr. D. E. Hughes, of the Army Engineers furnished me with the limits of the dredged channels, their widths and depths. This information is given in pencil on a copy of a map published by the Harbor Engineers, sub plan (#1). Referring to this plan. The channel between San Pedro and Long Beach has been dredged to a depth of twenty feet and the bottom of the cut is 200 feet wide and 100 feet from the Pierhead line. This channel was dredged by the Engineer Dept. dredge.

(6) Attention is called to a change in direction of the eastern part of the cut. It is 72° true approximately by our plane table survey and 74° as roughly corrected by Mr. Hughes in pencil on the plan instead of 75½° as shown on the plan. The soundings taken by this party verify the dredged depth .

(7) The Wilmington Channel as far as and including slip 5 was verified by two lines of soundings and the channel limits and depths shown on plans 1 and 2 are found correct. Above slip 5 no depths are shown on the plan and the sounding lines show a gradually decreasing depth from 22 feet at slip 5 to 15 feet off the Consolidated Lumber Co's. wharf.

(8) In the West Basin dredging on the 30' channel from the turning basin to the slip occupied by the 12,000 ton floating dry dock of Los Angeles S. B. & D. D. Co. was in progress at the time the soundings by this party were made. The details of this work are shown in pencil on plan #1 and at the time of writing the work has been completed with exception of the turn shown opposite the fitting out wharves. Work is still in progress on the channel on the east side of the west basin, this channel is indicated on Plan 1 and is to have the depth of 20' indicated.

(9) The depths and channel limits in the inner harbor channel and the outer harbor slips are shown on plan #1 supplemented by pencil notations by Mr. Hughes. The 26' spot in the 30' Watchorn Basin channel shown in pencil on plan 1, the 27' and 28' spots shown on Los Angeles Harbor Dept. Navigation chart (plan 2) and the 24' sounding on Chart 5145 in the Watchorn Basin channel were not found in the work by this party. It is possible that they are small hummocks left by dredges and may have disappeared.

(10) Subsequent to the sounding a small amount of additional dredging has been done in the 30' channel outside of Reservation Pt. and east of Municipal pier #1 to restore the channel where shoaling had occurred on the east side of the channel. This shoaling is indicated by an 8' sounding

about halfway between Reservation Pt. and the red beacon. After the dredging was completed additional lines were run in this locality and indicated that this shoal had been removed. The dredgings were pumped to the north eastward about 200 yards but probably caused no appreciable shoaling on account of the small volume dredged.

(11) Four of the outer harbor sounding lines cross the dredged channel leading to the new fill at the U. S. Military Reservation verifying the depths shown on blueprint (plan #3) which was forwarded with the instructions.

(12) A blueprint (plan #4) was obtained from the City Engineer of Long Beach showing depth curves in the entrance inside of the railroad bridge, the Turning basin and Channel #3 of the harbor at Long Beach. Sufficient sounding lines were run to verify this print and additional lines were run in Channels #1 and #2, the blueprint having no depth curves for these channels. The sounding lines between the jetties of the entrance to Long Beach harbor show a controlling depth of 7 feet at M.L.L.W. the shallowest point being about 300 yards outside of the bridge.

(13) The channel leading through the jetties is used by the Long Beach Shipbuilding Co. for taking out the 8800 ton vessels which have been built there although the depth through to the 20' dredged channel to San Pedro is 13 feet at M.L.L.W. This channel is, however, crooked and has a sharp turn at the northern end where it meets the straight cut. The vessels built at Long Beach draw about 13 feet when leaving the yard and of course are compelled to leave at good high water, and require a tug. Heavy swells break across the entrance at the outer end of the jetties and at such times the passage is dangerous for all sizes of vessels.

(14) A flood control or diversion channel has been dredged between Anaheim St. and the sea to the eastward of Long Beach Harbor using a part of the bed of the old Los Cerritos Slough. North of Anaheim St, no dredging will be done as levees have been built by scooping and dragging material from the center of the channel to the levees on either side, making the center of the channel about three feet below the general level of the land for a width of about 200 feet with a gradually increasing slope to the top of the levees which are about 15' high. Rock has been placed on the levees to prevent the flood waters from breaking through. The channel is designed to drain the area to the northward of Signal Hill and Dominguez Hills and about three miles to the northward of Anaheim St. the levees separate, the western levee extending to the Dominguez Hills. At the present time although the channel south of Anaheim St. is filled with water, the opening to the sea has not yet been made. The diversion channel, it is expected, will keep flood waters from the Long Beach and San Pedro harbors and prevent further silting. The Long Beach harbor dredging will be started shortly and the authorities expect to be able to accommodate shipping in the course of a year.

(15) Sounding lines were run in the vicinity of Weldt Rock. A least depth of 24 feet was obtained. No indication was found of the 26' spot shown on Chart 5145 200 m. 130° from Weldt Rock.

(16) Considerable discrepancies appear in the launch hydrography of the harbor between the 50 meter harbor development lines and the cross lines run later in the season, the later lines giving from one to three feet less depth than the original development. The later soundings are without doubt more reliable as greater care was taken, in checking leadline, a heavier lead was used and a more expert leadsman took the soundings. On August 30th I discovered that Mr. Eyman who was in charge of the launch work covering the harbor, was having the leadsman test the leadline without using a springbalance to show the tension. On the work done up to that time a six or eight pound lead was used and I believe that too much tension was placed on the line in testing. The repeated entries day after day of "leadline correct" in the sounding book lead me to inspect the testing of the leadlines and the above practice was what I found. The result of placing too much tension in testing the line would be greater depth than really existed. On the first ship work after this time, I observed the work of the leadsman, G. M. Pittman who had taken the soundings on the launch work in the harbor and found that he had a double fault of not lifting the lead sufficiently off bottom and of reading the line always to the nearest foot mark above water. It was not thought necessary to rerun the entire harbor survey as the cross lines will serve as a correction on the 50 meter lines.

(17) A sounding of 20' between positions 55 and 56 b day and a sounding of 22' between positions 147 and 148 b day of launch work in the outer harbor appear to be errors of one fathom in reading the line or in recording; they probably should be 14 feet and 16 feet respectively. A sounding of 15 feet between positions 122 and 123 b day, a sounding of 6' on position 104 F and a sounding of 9' on position 37 d of the launch work in the outer harbor appear to be errors of one fathom in reading the leadline or recording, they should probably be 21', 12', and 15' respectively. Lines run later over the positions failed to check the soundings as recorded. A sounding of 12 feet at position 21 m, launch 1/10,000 sheet, and soundings of 32 feet between position 29 and 30 H, and of 72 feet at position 60 C Ship 1:10,000 sheet, appear to be errors of reading leadline or of recording and should be 18', 38', and 66' respectively.

(18) No important changes have been noted in the area covered by the 1:10,000 sheet eastward of the harbor. Two piers off Long Beach not shown on the chart were located by plane table. No boats land at these piers. Surf usually breaks at the outer end of the amusement pier just to the westward of the Pine St. pier. The amusement pier has upon it a number of concessions among which a gravity racer and an aeroplane machine are prominent. The pier is built on wooden piling. The other new pier which is at the foot of 39th St. is built of concrete on concrete piling. It has two small pavilions, one on the outer end and one at the middle of its length. About 85 feet of the outer end of the old Pine St. pier has been washed away by storms and has been repaired, leaving it that much short of its original length. There are two boat landings on the eastern side near the outer end at which land a line of launches from San Pedro during daylight in fair weather.
White can buoy #1 shown off Pt. Fermin was not found. Nos. 2,3, and 4 were located. Two white can buoys and five small spar buoys in a line with the stacks of the Southern California Edison Co. at W. Long Beach N. 11 W were located. They are used by the Submarine Base.

(19) On the ship work of the 1:10,000 sheet and on all the work on the 1:20,000 sheet which was done entirely by ship, the work of plotting and directing the lines was done by Mr. R. P. Eyman while the Chief of Party supervised the sounding and instructed the leadsmen. By close observation and study of the subject and by personal experience in handling the lead I am convinced that the average leadsman sounding from a vessel usually obtains a greater sounding than actually exists. This is due to the fact that the line is curved forward below the water when it is vertical above the water, that is the lead is then on the bottom in a position forward. By lifting the lead off bottom twice and reading it when it slants slightly aft, the least water is obtained and is very nearly correct. Few leadsmen appreciate this however, and it is difficult to make them believe it.

(20) Outside of the 12 fathom curve on the 1:20,000 sheet, a trolley apparatus was used. The apparatus was rigged by the ships force and for some time gave considerable trouble due to the difficulty of getting sufficient length and slant of the wire rope and due to stretch and breakage of the belt drive on the electric drum hauling reel which was constructed by ships force. Finally by perfecting a belt and by an alteration in the lead of the leadling highly satisfactory results were obtained, that is soundings one minute apart in 14 fathoms and 1-1/4 minutes apart in 19 - 20 fathoms.

(21) The 10 fathom shoal three miles 138° true from the breakwater light was developed in accordance with instructions. It is a flat shoal of large area and the bottom is gravel as contrasted with the fine gray sand of San Pedro Bay. A few isolated kelp stems with leaves were observed scattered over the center of the shoal, they barely reach the surface. The least water found was 67 feet.

(22) The only important difference from the existing chart was found in the S. E. corner of the sheet where the lines laid out to develop the 20 fathom curve picked up a pronounced inward curve, and two no bottom at 27 fathom soundings were obtained with the trolley, one the outer end of the lines at this point. Subsequent development disclosed the existence of a submarine valley with its inshore end at about the 20 fathom curve. It was developed as far as the limits of the sheet with hand sounding machine, using a 30# lead. The greatest depth found was 89½ fathoms which indicated the 100 fathom curve to be close off shore and it was not thought necessary to extend the development further. Blue mud was found in the bottom of the ravine and a few yellow gravel specimens were picked up on the slopes.

(23) Coast Pilot Notes. The following additions and corrections to the present Coast Pilot are noted:

The channel leading from sea to Long Beach Harbor is crossed at the inner end ofthe jetties by a railroad Bascule Bridge, single leaf, 180' span.

Supplies: Fuel oil, Diesel oil, kerosene, and gasoline can be

obtained in any quantity. There are four companies, The Standard Oil Co., Union Oil Co., Puente Oil Co., and General Petroleum Corp., the latter have 4 pipe lines to a dock on the breakwater where the deepest draft vessels may load. There is a coal pile on the dock of the Outer Harbor Dock & Wharf Co. At times the amount on hand is small but any amount can be obtained at short notice. Utah coal of good quality can be obtained.

Repairs. The Los Angeles S. B. & D. D. Co. have a 12000 ton floating drydock and two 100 ton shear legs at their shipyard in the West Basin. The Long Beach S. B. Co. have a 3500 ton floating drydock at the plant in Long Beach and there are several small marine railways at Wilmington and at Fish Harbor for hauling launches.

The Weather Bureau now displays storm warnings from the steel tower on top of the City Warehouse on Pier 1, Outer Harbor.

Steam and gasoline tugs are available for handling vessels in the Inner Harbor. The City maintains a gasoline fire tug.

The Radio Corporation of America has a station at San Pedro. Telephone exchanges at Avalon, Catalina Isl., Los Angeles, and Long Beach are connected by wireless telephone for direct communication between induviduals and these places.

The following booklets etc. are attached to this report.

Booklet: Los Angeles, the Great Seaport of the Southwest, by Board of Harbor Commissioners.

Booklet: Los Angeles Harbor Rules and Regulations, by Board of Harbor Commissioners.

Pamphlet: Facts about Los Angeles Harbor.

6 Blimp photographs, Los Angeles Harbor.

F. G. Engle

F. G. ENGLE,
H. & G. Engineer,
Chief of Party.

HYDROGRAPHY

SAN PEDRO BAY CALIFORNIA

Statistics Sheet No. A.

Date	1920	Letter	Volume	Positions	Soundings	Miles Statute	Vessels
Aug.	16	a	1	42	190	4.7	Motor Sailer
	18	b	1	172	696	17.7	"
	19	c	1	143	537	12.2	"
	20	d	1	83	330	8.5	"
	20	d	2	125	530	12.1	"
	21	e	2	108	523	11.9	"
	23	f	2	214	1126	23.1	"
	24	g	3	230	1092	24.0	"
	25	h	3	196	917	20.3	"
	26	i	3	21	118	2.0	"
	26	i	4	108	554	10.5	"
	27	k	4	119	609	11.5	"
	30	l	4	146	623	17.5	"
Sept.	2	A	1	99	425	21.3	Ship
	3	B	1	118	439	23.2	"
	8	C	1	124	564	23.3	"
	17	D	1	106	386	18.3	"
	17	D	2	26	129	4.8	"
	23	E	2	15	53	2.1	"
Oct.	4	F	2	197	661	34.1	"
	5	G	2	113	322	18.9	"
	8	H	2	33	95	6.0	"
	14	I	2	128	468	18.8	"
TOTAL				2866	11,327	345.8	

HYDROGRAPHY

SAN PEDRO BAY CALIFORNIA

Statistics Sheet No. A. (continued)

Date	m 1920	Letter	Volume	Positions	Soundings	Miles Statute	Vessels
Brot Fwd.				3666	11,337	345.8	
Oct.	14	I	3	31	120	4.6	Ship
	26	K	3	69	230	10.5	"
Nov.	3	m	5	179	739	21.3	Motor Sailer
Dec.	8	n	4	68	226	7.8	"
	8	n	6	93	316	9.2	"
	9	o	5	85	412	7.8	"
	13	L	3	9	9	0.0	Ship
TOTAL				3200	13,379	407.0	

Soundings in feet.

Plane of Reference: Mean Lower Low Water.

Tidal Note:

Automatic Tide gauge and Tide staff used at "Outer Harbor Wharf and Dock Co. San Pedro, Harbor.

Plain Tide staff only used at Long Beach

San Pedro Harbor Tide Gauge

Plane of Reference, reading on gauge	3.8
Lowest Tide observed, reading on gauge	2.0
Highest Tide observed, reading on gauge	10.6

Long Beach Tide Staff

Plane of Reference, reading on gauge	3.45
Lowest Tide Observed, reading on gauge	2.9
Highest Tide observed, reading on gauge	9.1

Note.

For days on which each gauge was used in tide reductions to soundings, see sounding records.

HYDROGRAPHY

SAN PEDRO BAY CALIFORNIA

Statistics Sheet No. B.

Date 1920	Letter	Volume	Positions	Soundings	Miles Statute	Vessels
Sept. 10	A	1	79	190	21.85	Ship
15	B	1	82	145	18.2	"
16	C	1	45	90	10.82	"
20	D	1	84	150	16.6	"
23	E	1	61	112	13.9	"
24	F	1	122	175	23.8	"
Oct. 1	G	2	126	295	29.9	"
5	H	2	44	153	8.9	"
6	I	2	140	471	32.8	"
8	K	2	117	343	20.6	"
11	L	2	44	120	9.4	"
11	L	3	70	98	15.0	"
12	M	3	134	509	30.1	"
13	N	3	146	440	31.1	"
18	P	3	96	139	13.2	"
20	Q	4	172	318	34.5	"
21	R	4	165	238	34.0	"
22	S	4	101	250	20.7	"
25	T	4	52	136	11.3	"
25	T	5	46	116	10.3	"
26	U	5	99	284	21.8	"
Dec. 13	V	5	85	85	11.5	"
TOTAL			2110	4757	440.37	

HYDROGRAPHY

SAN PEDRO BAY CALIFORNIA

Statistics Sheet No. 1 B. continued

Soundings in feet.

Plane of Referende: Mean Lower Low Water.

Tidal Note:

Automatic Tide gauge and Tide staff used at "Outer Harbor Wharf and Dock Co. San Pedro, Harbor.
Plain Tide Staff only used at Long Beach.

San Pedro harbor Tide Gauge

Plane of reference, reading on gauge	3.8
Lowest Tide observed, reading on gauge	2.0
Highest tide observed, reading on gauge	10.6

Long Beach Tide Staff.

Plane of referende, reading on gauge	3.45
Lowest Tide observed, reading on gauge	2.9
Highest Tide observed, reading on gauge	9.1

Note.
For days on which each gauge was used in tide reductions to soundings, see sounding records.

ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY

AND REFER TO NO. 41/VFB

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

WASHINGTON May 19, 1921.

Division of Hydrography and Topography:

Division of Charts:

Tidal reductions are approved in
5 volumes of sounding records for

HYDROGRAPHIC SHEET 4162

Off Los Angeles Harbor, California
F. G. Engle in 1920

Plane of reference is
Mean lower low water, reading

2.8 ft. on tide staff at Long Beach
3.2 ft. " " " " Outer Harbor

Condition of records: Satisfactory.

G Tide

Chief, Division of Tides and Currents.

Hyd Sheet No 4162
(Scale 1-20,000)

On this sheet, the ground is well covered and shoal developement sufficient.

Soundings cross well.

"M" day, shown with blue position numbers, was plotted on the sheet from the records of Hyd. 4163.

The ten fathom spot, southeast of Breakwater Lt. Ho., is actually ten fathoms and four feet.

R. L. Johnston

DIRECTOR
ADDRESS THE [redacted]
U. S. COAST AND GEODETIC SURVEY

AND REFER TO No. 9-MEM

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

WASHINGTON

SECTION OF FIELD RECORDS.

REPORT ON HYDROGRAPHIC SHEET No. 4162.

Surveyed in 1920.

Chief of Party: F. G. Engle. Surveyed by party of Str. MATOMA.

Protracted and soundings plotted by H. E. MacEwen.

Verified and inked by R. L. Johnston.

1. The records conform to the requirements of the General Instructions.

2. The plan and character of development fulfill the requirements of the General Instructions.

3. The plan and extent of development satisfy the specific instructions.

4. The sounding line crossings are adequate.

5. The protracting and plotting of soundings, which should have been done in the field was done by the office draftsman.

6. The development is sufficient to permit the usual depth curves to be drawn.

7. No further surveying is needed within the area covered by this sheet. Additional development might have been made in the vicinity of the 10 fathom spot (actually 64 feet) which forms an extension of the 10 fathom curve southeast of the outer end of the breakwater. There are not sufficient indications of shoaling on this spot, however, to necessitate further work there.

8. The character and scope of the surveying are excellent.

9. Reviewed by E. F. Ellis, August, 1921.

Approved -

H. L. S.

LCC

June 18, 1921.

Division of Hydrography and Topography:

Division of Charts:

Tidal reductions are approved in
3 volumes of sounding records for

HYDROGRAPHIC SHEET 4162

Locality: Off Los Angeles Harbor, California.

Chief of Party: F. G. Engle in 1920

Plane of reference is mean lower low water, reading

3.2 ft. on tide staff at Outer Harbor, San Pedro.

Condition of records: Satisfactory.

Harrison

Acting Chief, Division of Tides and Currents.

Note: These three volumes are in addition to the five original volumes on H. S. 4162. They were numbered 4163 by the field party, but changed to 4162 by the Section of Field Records, Chart Division.